

FIG. 1A

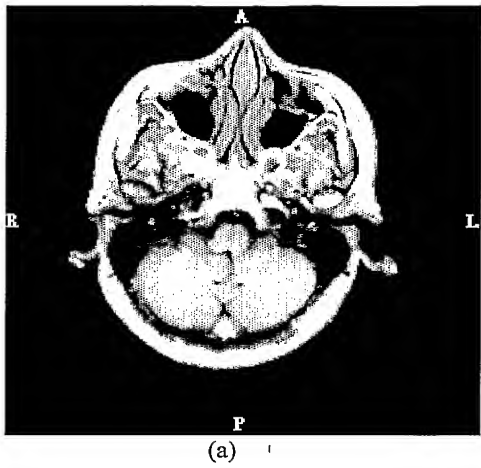


FIG. 1B

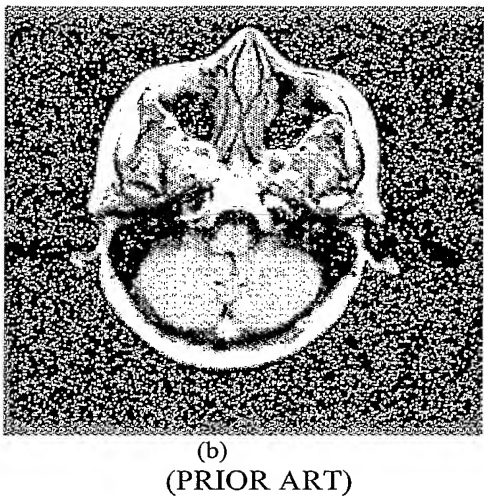


FIG. 2

200

+	-	+	-	+	-	+	-
-	+	-	+	-	+	-	+
+	-	+	-	+	-	+	-
-	+	-	+	-	+	-	+
+	-	+	-	+	-	+	-
-	+	-	+	-	+	-	+
+	-	+	-	+	-	+	-
-	+	-	+	-	+	-	+

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FIG. 3

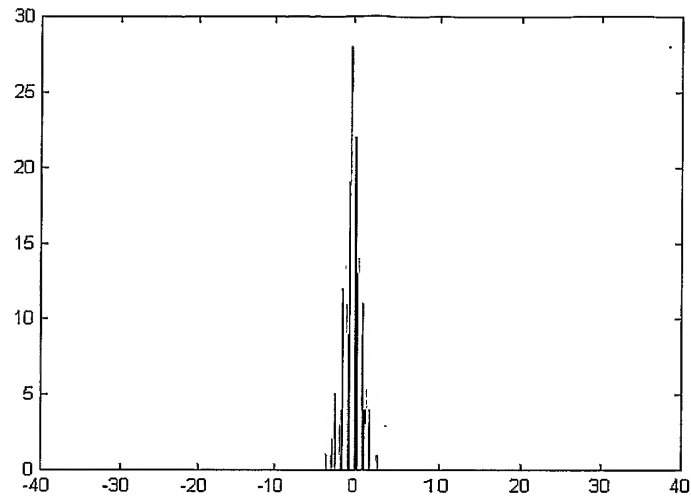
Figure 3: the distribution of the difference value α .

FIG. 4

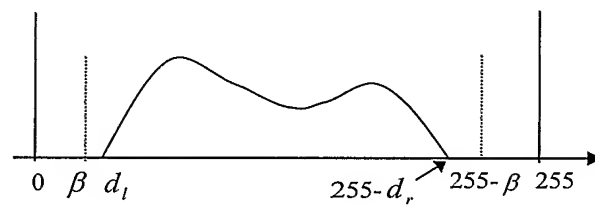
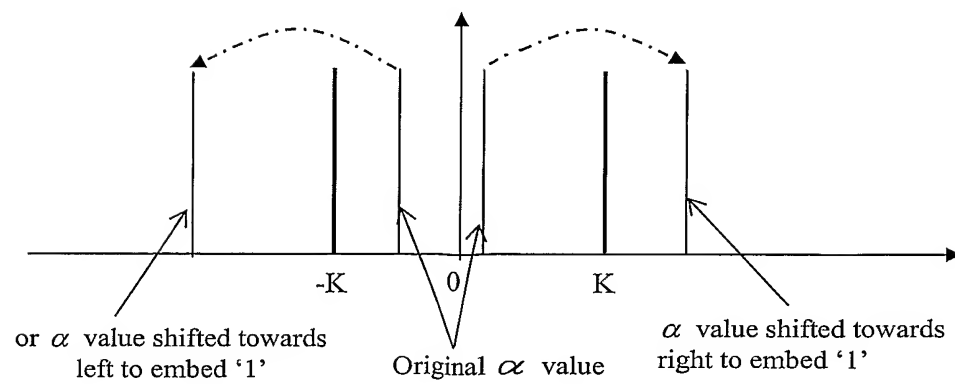


FIG. 5



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FIG. 6

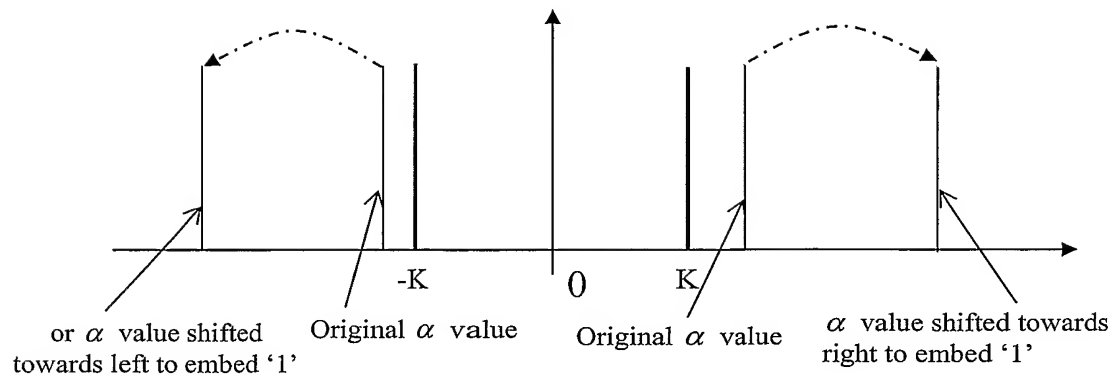


FIG. 7

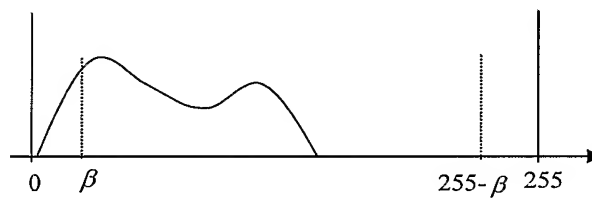
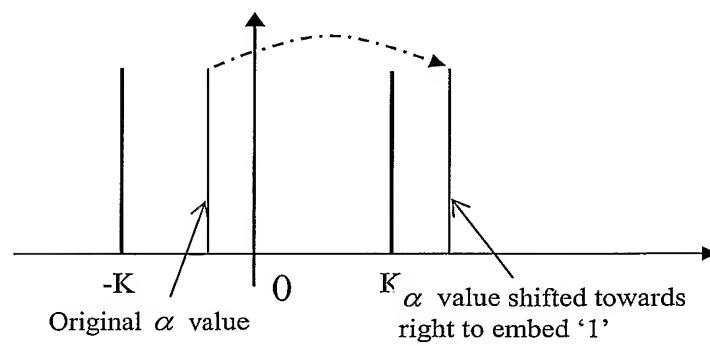


FIG. 8



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FIG. 9

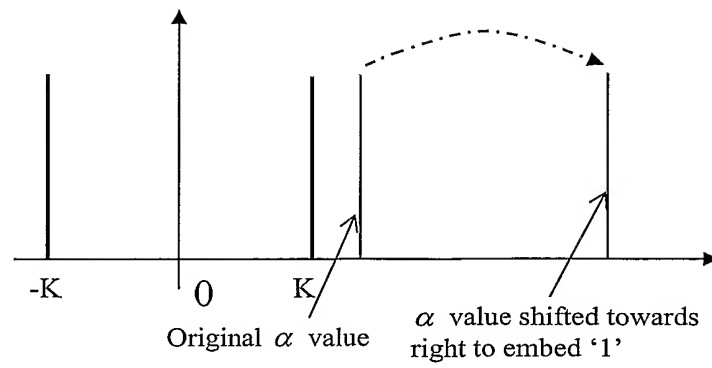


FIG. 10

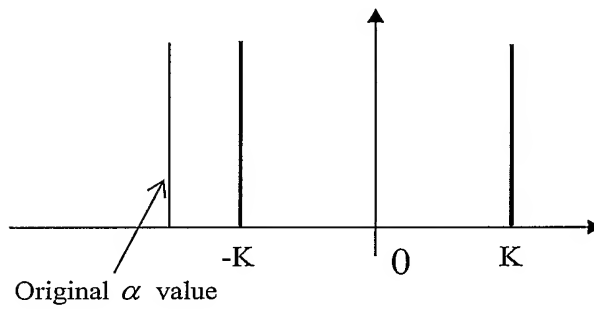


FIG. 11



FIG. 12

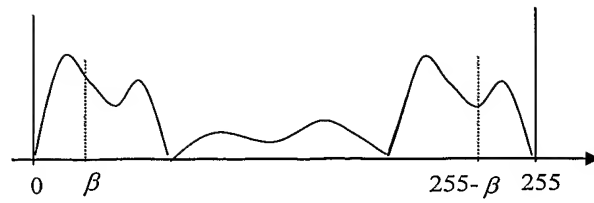


FIG. 13

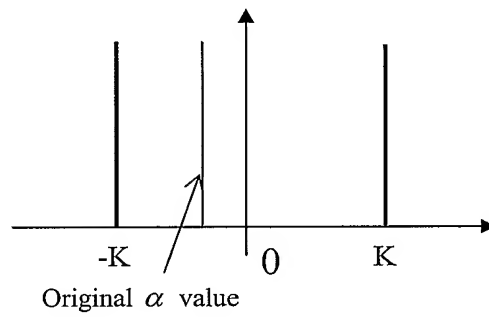
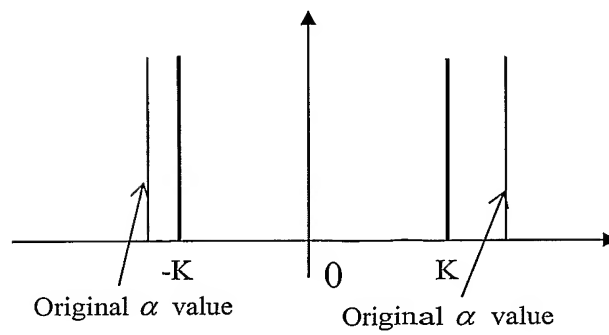


FIG. 14



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FIG. 15

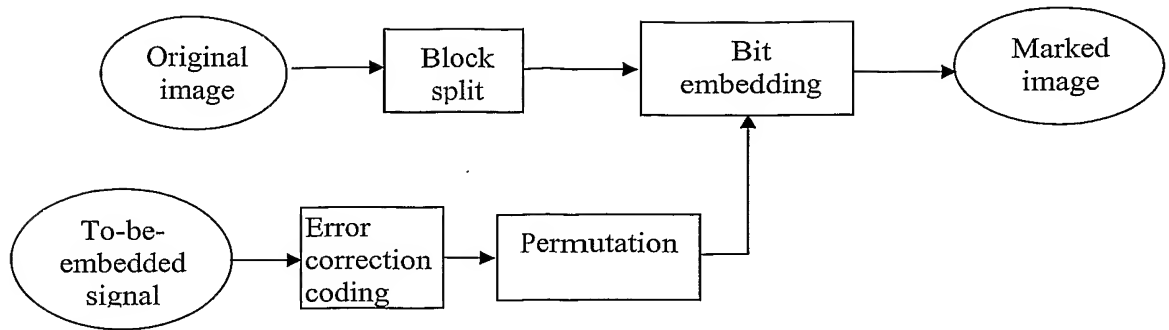


FIG. 16

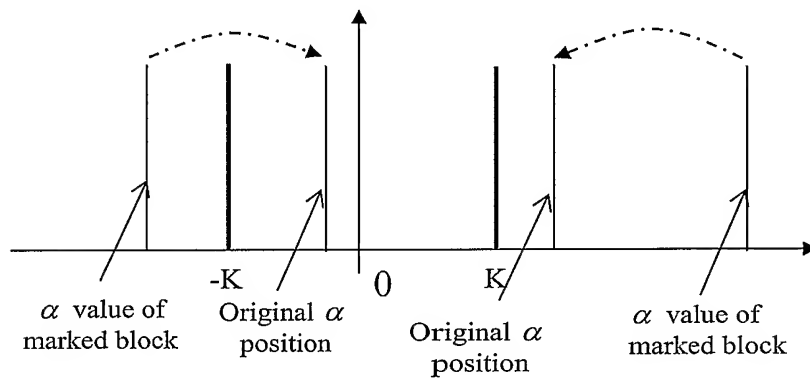


FIG. 17

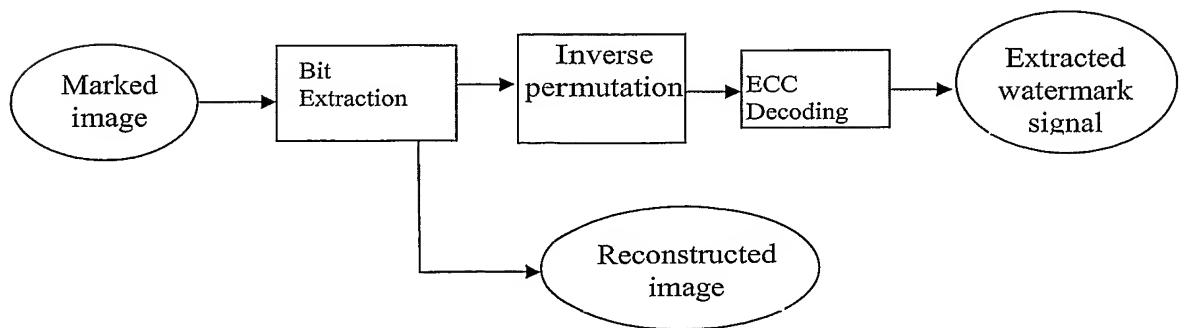


FIG. 18A

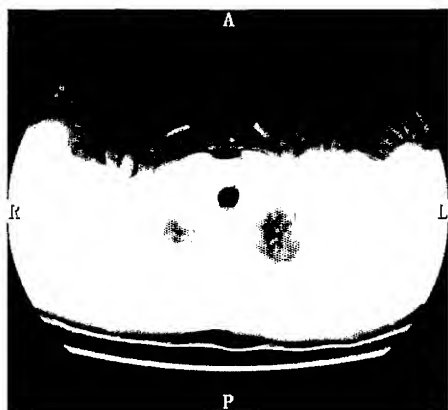


FIG. 18B

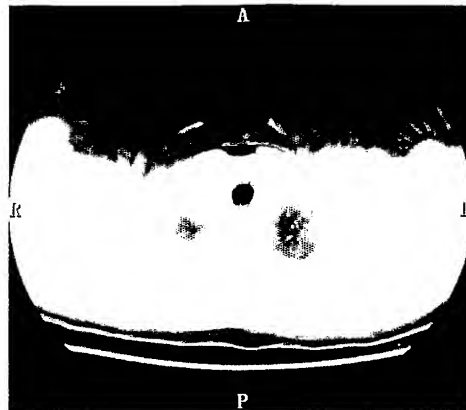


FIG. 19A

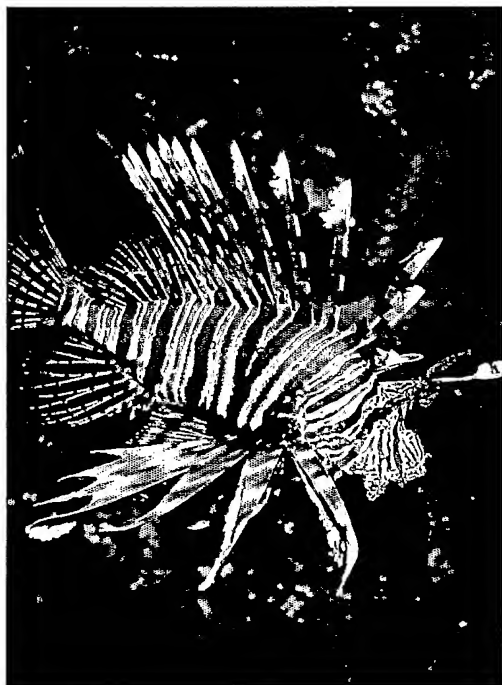


FIG. 19B

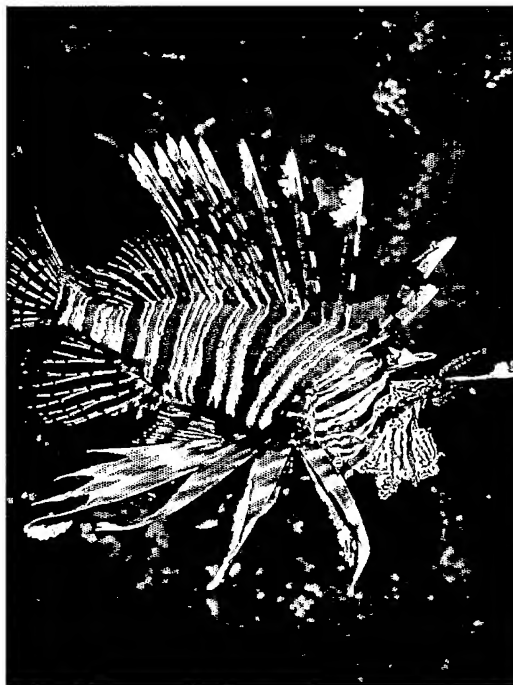


FIG. 20A



FIG. 20B



FIG. 21

	Lena	Baboon	Boat
PSNR (dB)	40.2	38.7	40.5
Capacity (bits)	792	585	560
Robustness (bpp)	0.8	1.6	1.0

FIG. 22

Images (512×768)	PSNR of marked image (dB)			Data embedding capacity (bits)	Robustness (bpp)		
	Max	Min	Avg		Max	Min	Avg
	45.2	37.4	40.2	714	2.0	0.2	1.21

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FIG. 23

Images (512×512)	PSNR of marked image (dB)	Data embedding capacity (bits)	Robustness (bpp)
Mpic1	37.6	100	0.4
Mpic2	37.7	100	0.8
Mpic3	37.6	100	0.4
Mpic4	37.6	100	0.8
Mpic5	37.6	100	0.4
Mpic6	37.6	100	1.2
Mpic7	37.6	100	0.4
Mpic8	37.6	100	0.8

FIG. 24

Images (1536×1920)	PSNR of marked image (dB)	Data embedding capacity (bits)	Robustness (bpp)
N1A (Woman)	41.5	1410	0.8
N2A	41.3	1410	1.2
N3A	41.3	1410	0.8
N4A	41.4	1410	0.8
N5A	41.3	1410	0.8
N6A	41.2	805	0.4
N7A	41.2	1410	0.8
N8A	41.2	805	1.2

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FIG. 25

	Block size	Embed level	Mpic1		Mpic2		Mpic3		Mpic4		Mpic5		Mpic6		Mpic7		Mpic8	
			PSNR (dB)	Robustness	PSNR (dB)	Robustness	PSNR (dB)	Robustness	PSNR (dB)	Robustness	PSNR (dB)	Robustness	PSNR (dB)	Robustness	PSNR (dB)	Robustness	PSNR (dB)	Robustness
Proposed algorithm	8	4	40.5	0.4	40.7	0.8	40.6	0.8	40.6	0.8	40.6	0.8	40.5	1.2	40.5	0.4	40.5	0.8
		6	37.6	0.4	37.7	0.8	37.6	0.4	37.6	0.8	37.6	0.4	37.6	1.2	37.6	0.4	37.6	0.8
		8	35.4	0.4	35.6	0.8	35.5	0.4	35.4	0.4	35.4	0.4	35.5	0.8	35.4	0.4	35.4	0.4
		10	33.7	0.4	33.8	0.4	33.7	0.4	33.7	0.4	33.7	0.4	33.7	0.8	33.7	0.4	33.7	0.4
	12	4	40.7	0.4	40.9	0.8	40.7	0.4	40.7	0.8	40.7	0.8	40.8	1.2	40.7	0.4	40.7	0.8
		6	37.8	0.4	38	0.8	37.8	0.4	37.8	0.8	37.8	0.4	37.9	1.2	37.8	0.4	37.8	0.8
		8	35.5	0.4	35.6	0.8	35.7	0.4	35.6	0.4	35.6	0.4	35.7	0.8	35.6	0.4	35.6	0.4
		10	33.8	0.2	34.1	0.4	33.8	0.2	33.8	0.4	33.8	0.2	34	0.8	33.8	0.2	33.8	0.4
	16	4	40.6	0.4	40.9	0.8	40.6	0.4	40.6	0.8	40.6	0.4	40.7	1.2	40.6	0.4	40.5	0.8
		6	37.7	0.2	38	0.4	37.7	0.2	37.7	0.4	37.7	0.2	37.8	0.8	37.6	0.2	37.6	0.4
		8	35.5	0.4	35.9	0.8	35.5	0.4	35.5	0.4	35.5	0.4	35.6	0.8	35.5	0.4	35.4	0.4
		10	33.8	0.2	34	0.4	33.8	0.2	33.8	0.4	33.8	0.2	33.9	0.8	33.8	0.2	33.7	0.4
Algorithm in [9]	8	4	9.9	1.6	4.9	1.6	29.0	1.2	29.1	0.8	29.1	1.6	5.8	2.0	10.1	0.8	6.2	1.2
		6	9.9	0.8	4.9	1.6	28.1	0.8	28.2	0.4	28.2	0.8	5.9	2.0	10.5	0.8	6.3	1.6
		8	9.9	0.8	5.0	2.0	27.1	0.8	27.2	0.4	27.2	1.6	5.9	1.6	10.3	0.8	6.3	2.0
		10	9.8	1.6	5.1	1.6	26.1	0.8	26.2	0.4	26.2	0.8	6.0	2.0	7.8	0.8	6.4	2.0
	12	4	10.1	0.8	5.0	1.6	28.0	0.8	28.2	0.8	28.6	1.2	6.0	2.0	10.8	0.8	6.4	1.6
		6	10.1	0.8	5.1	1.6	27.2	0.4	27.5	0.2	27.8	0.2	6.0	2.0	10.8	0.4	6.4	1.6
		8	10.1	0.8	5.1	2.0	26.4	0.8	26.6	1.6	26.8	0.4	6.1	2.0	10.6	0.8	6.5	0.8
		10	9.9	0.8	5.2	2.0	25.6	2.0	25.7	0.4	26.0	0.2	6.1	2.0	8.0	0.8	6.5	0.8
	16	4	10.6	0.8	5.3	1.6	29.0	0.8	29.2	0.8	29.2	0.4	6.4	1.2	11.2	0.8	6.9	1.2
		6	10.6	0.8	5.4	0.8	28.2	2.0	28.3	0.2	28.3	0.2	6.4	0.8	11.3	0.4	7.0	0.8
		8	10.6	0.8	5.4	1.6	27.3	0.8	27.4	0.4	27.4	0.4	6.5	1.6	11.1	0.8	7.0	0.8
		10	10.4	0.8	5.5	0.8	26.3	0.2	26.4	0.2	26.4	0.2	6.5	0.8	8.1	0.4	7.0	0.8

FIG. 26

	Block size	Embedding level	Average PSNR (dB)			Average robustness (bpp)		
Proposed algorithm	8	4	40.5	36.8*	36.9**	0.75	0.59*	0.53**
		6	37.6			0.65		
		8	35.4			0.5		
		10	33.7			0.45		
	12	4	40.7	37.0*		0.7	0.55*	
		6	37.8			0.65		
		8	35.6			0.5		
		10	33.8			0.35		
	16	4	40.6	36.9*		0.65	0.46*	
		6	37.7			0.35		
		8	35.5			0.5		
		10	33.8			0.35		

Algorithm in [9]	8	4	15.5	15.0*	15.1**	1.35	1.24*	1.04**
		6	15.2			1.1		
		8	14.8			1.25		
		10	14.3			1.25		
	12	4	15.4	14.8*		1.2	1.09*	
		6	15.0			0.9		
		8	14.7			1.15		
		10	14.0			1.125		
	16	4	16.0	15.4*		0.95	0.78*	
		6	15.7			0.75		
		8	15.3			0.9		
		10	14.6			0.525		

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FIG. 27

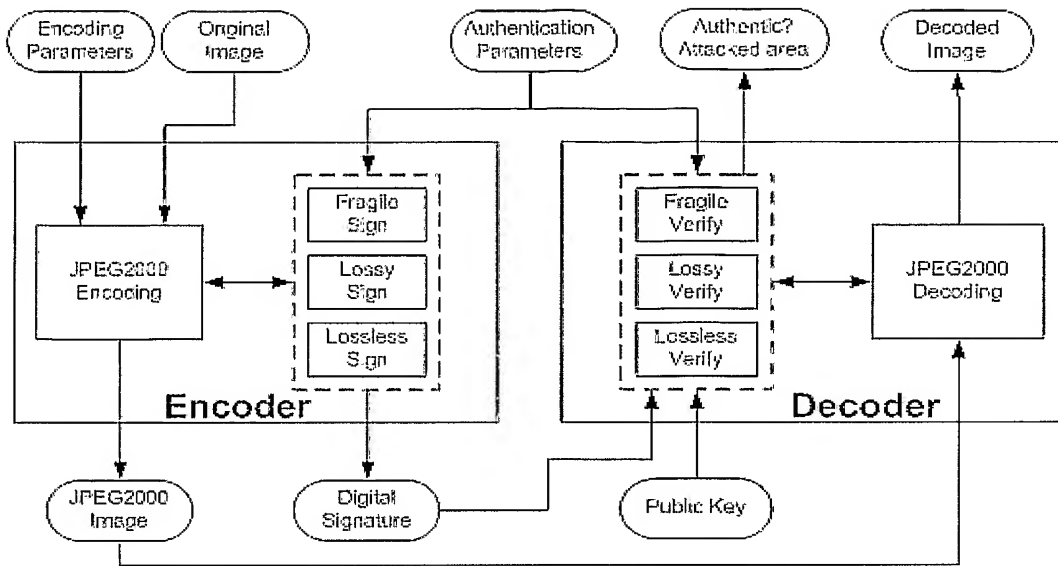


FIG. 28

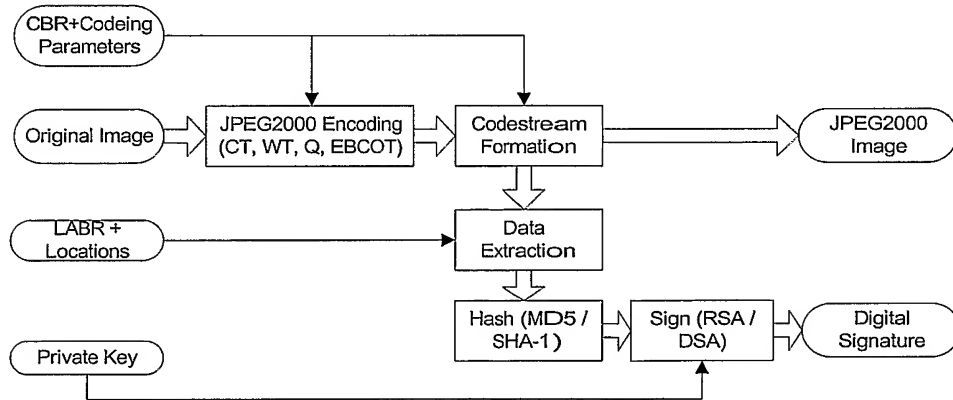


FIG. 29

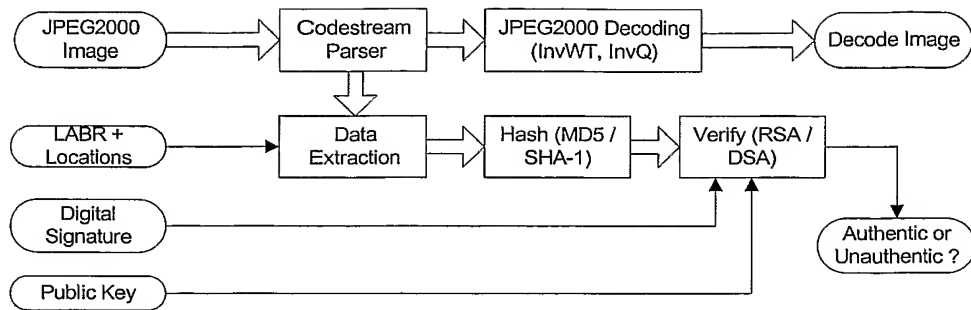
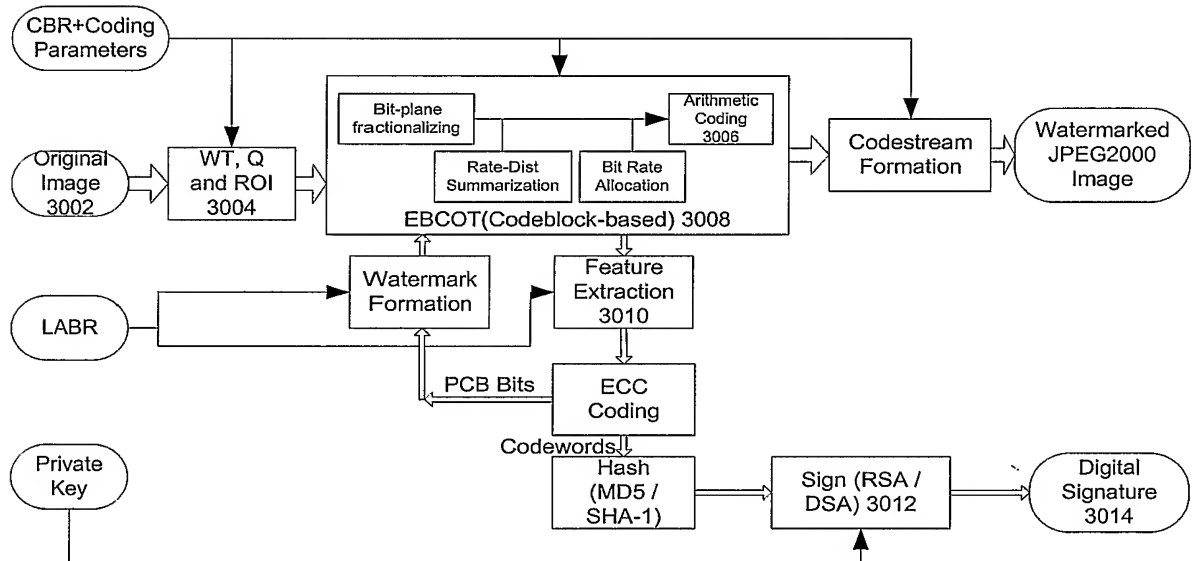


FIG. 30



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FIG. 31

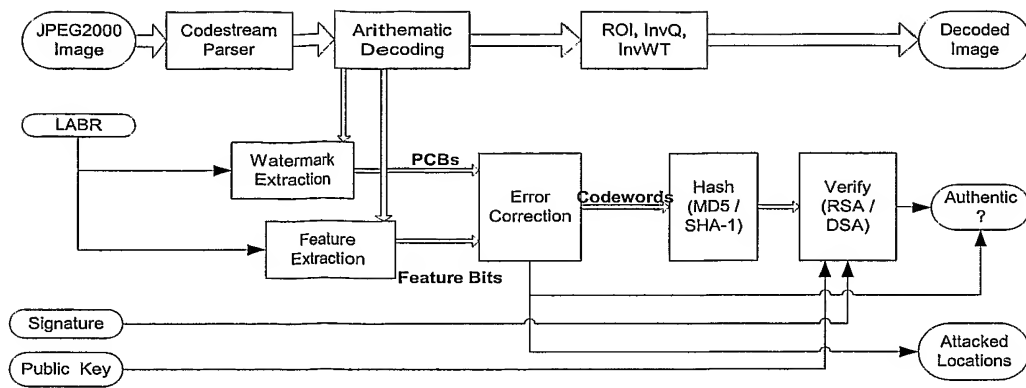


FIG. 32

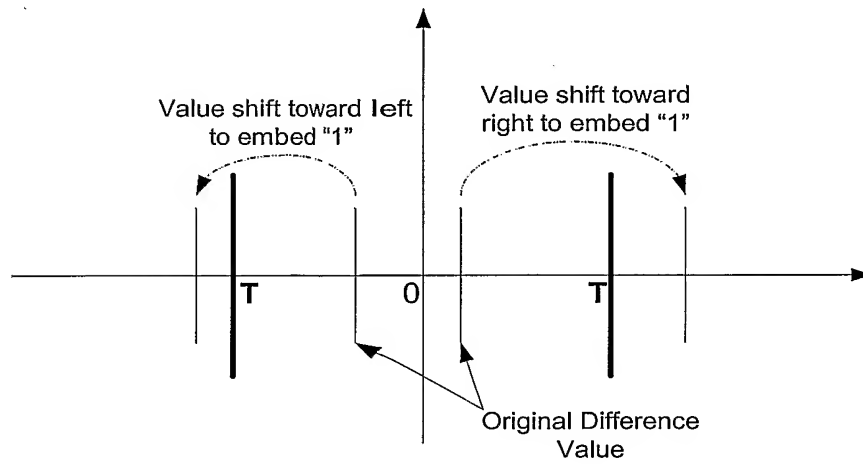


FIG. 33

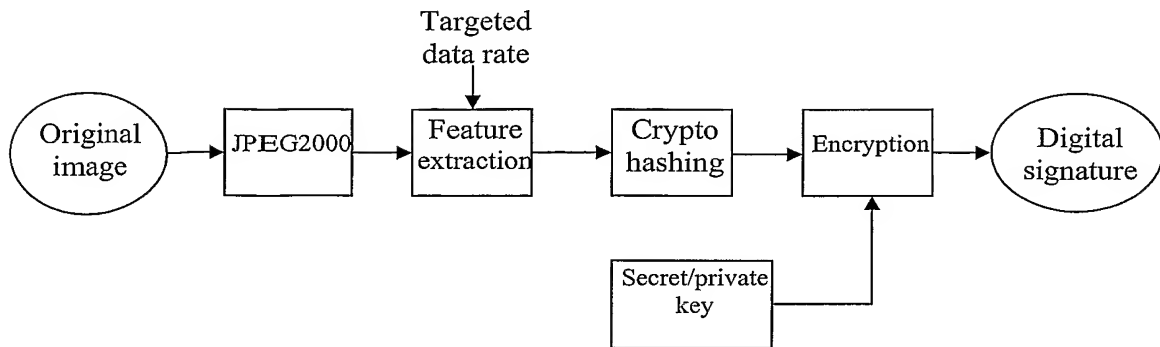


FIG. 34

